

### REMARKS

The present application includes pending claims 1-5, 7-10 and 12-23, all of which have been rejected. Claims 1 and 21-23 have been amended.

Claims 1-5, 7-10 and 12-23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. 4,054,881 ("Raab") in view of U.S. 6,073,043 ("Schneider"). The Applicant respectfully traverses these rejections for at least the following reasons:

Claim 1 recites, in part, "a single coil mounted on one of said receiver assembly and said transmitter assembly, said single coil being positioned a fixed and known distance away from one of said receiver coil trio and said transmitter coil trio, wherein when said receiver assembly is moved relative to said transmitter assembly, relative motion among said transmitter coil trio, said receiver coil trio and said single coil is asymmetrical, wherein the asymmetrical relative motion alleviates hemisphere ambiguity."

Raab discloses a system including "three orthogonal electromagnetic field receiving means located at a remote object [that] are used to sense three distinct electromagnetic fields radiated by three orthogonal transmitting means located at a reference coordinate frame." Raab at column 2, lines 25-29. Raab discloses a "ground antenna array 40 [that] includes orthogonal loop antennas 41, 42, and 43" and "antenna array 21 [that] includes receiving loop antennas 22, 23 and 24...." *See id.* at column 3, lines 48-64.

Raab discloses resolving ambiguities "by comparing the signs of the received signal vectors, or equivalently the crossing angles among them...." *See id.* at column 9, lines 50-54. Raab also discloses that "if landing aid system 10 is supplied with the information that the airplane is right side up, [the position/orientation] ambiguity is eliminated." *See id.* at column 10, lines 19-30. Additionally, Raab discloses the following:

Of course, independent information sources may be used to remove this ambiguity. For example, navigation aids may be used to determine the quadrant (i.e. northeast, southeast, northwest or southwest) of [sic] the remote object with respect to the radiating means; altimeters may be used to determine the relative height of the remote object with respect to the radiating means, which may be located at the top of the hill.

*Id.* at column 10, lines 50-57.

Raab does not, however, describe eliminating or alleviating hemisphere ambiguity through asymmetrical relative motion among a transmitter coil trio, a receiver coil trio and a single coil mounted on either a receiver assembly or a transmitter assembly. Indeed, Raab does not even describe, teach or suggest a single coil positioned a fixed and known distance away from one of the receiver coil trio and the transmitter coil trio.

Schneider discloses a system having a “remote sensor having one or more field-sensing elements for sensing the fields generated and a processor for processing the outputs of the sensing element(s) into remote object position and orientation relative to the generating element reference coordinate frame.” *See* Schneider at Abstract. Schneider discloses that the sensing devices can be “one, two or three axis magnetic sensing elements such as coils of wire” and the “field generating devices can be one, two or three-axis coils of wire or magnets.” *See id.* at column 5, lines 45-40. Further, “[a]ll configurations can be reversed using the principal [sic] of reciprocity...” *See id.* at column 5, lines 40-42.

The Office Action cites Schneider at Abstract, column 5, lines 35-43 and 56-62, column 13, lines 6-10, column 25, lines 48-53 and column 27, lines 57-60. *See* May 13, 2008 Office Action at pages 3-4. However, none of these cited portions of Schneider describes, teaches or suggests “a single coil mounted on one of said receiver assembly and said transmitter assembly, **said single coil being positioned a fixed and known distance away from one of said receiver coil trio and said transmitter coil trio**, wherein when said receiver assembly is moved relative to said transmitter assembly, **relative motion among said transmitter coil trio, said receiver coil trio and said single coil is asymmetrical, wherein the asymmetrical relative motion alleviates hemisphere ambiguity**,” as recited in claim 1. For example, while Schneider discloses “adding additional coils adds additional equation (increasing m) for the least squares problem to fit to” and that “this can reduce the errors in the P&O solution” at column 13, lines 6-10, this cited portion of Schneider is silent as to positioning a **single coil a fixed and known distance away from a receiver coil trio or a transmitter coil trio** and wherein **asymmetrical relative motion between those three components alleviates hemisphere ambiguity**.

In general, the Office Action has not shown where or explained how either Raab or Schneider describes, teaches or suggests “a single coil mounted on one of said receiver assembly

and said transmitter assembly, **said single coil being positioned a fixed and known distance away from one of said receiver coil trio and said transmitter coil trio**, wherein when said receiver assembly is moved relative to said transmitter assembly, **relative motion among said transmitter coil trio, said receiver coil trio and said single coil is asymmetrical, wherein the asymmetrical relative motion alleviates hemisphere ambiguity**,” as recited in claim 1. Thus, for at least these reasons, the Applicant respectfully requests reconsideration of the rejection of claims 1-5 and 7-9.

Independent claim 10 recites, in part, “a single receiving coil mounted on said receiver assembly and **positioned a fixed and known distance away from said receiver coil trio**, ... wherein when said receiver assembly is moved relative to said transmitter assembly, **while maintaining a constant orientation**, to a position in which one of said receiver coil trio and said single receiving coil is located at a position that is **diametrically opposite from an initial position of said one of said receiver coil trio and said single receiving coil**, the other of said receiver coil trio and said single receiving coil is located at a position that is **not diametrically opposite from an initial position of said other of said receiver coil trio and said single receiving coil, wherein the single receiving coil nullifies hemisphere ambiguity**.” The Applicant respectfully submits that the Office Action has not shown where or explained how either cited reference describes, teaches or suggests these limitations. Thus, for at least these reasons, the Applicant respectfully requests reconsideration of the rejection of claims 10 and 12-14.

Independent claim 15 recites, in part, “mounting a single receiver coil on the second body a fixed and known distance away from the receiver coil trio so that movement between the transmitter coil trio, the receiver coil trio and the single receiver coil is asymmetrical resulting in different magnetic field measurements by the receiver coil trio and the single receiver coil at every position during movement, wherein said mounting a single receiver coil on the second body alleviates hemisphere ambiguity.” For at least the reasons discussed above with respect to claim 1, the Applicant respectfully requests reconsideration of the rejection of claims 15-20.

Additionally, the Applicant respectfully requests reconsideration of the rejection of claims 21-23 for at least the reasons discussed above with respect to claim 1.

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In general, the Office Action makes various statements regarding the claims and the cited reference that are now moot in light of the above. Thus, the Applicant will not address such statements at the present time. The Applicant expressly reserves the right, however, to challenge such statements in the future should the need arise (e.g., if such statement should become relevant by appearing in a future claim rejection).

The Applicant respectfully submits that the pending claims of the present application define patentable subject matter, and request reconsideration of the claim rejections. If the Examiner has any questions or the Applicant can be of any assistance, the Examiner is invited to contact the undersigned attorney for the Applicant. The Commissioner is authorized to charge any necessary fees, or credit any overpayment to Account No. 07-0845.

Respectfully submitted,

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